We Claim:

1. An apparatus comprising an atomizer, wherein said atomizer comprises:

an arrangement for converting, into shock waves, at least ten percent of an energy of a flow of gas that flows at supersonic velocity; and

a liquid outlet, wherein said liquid outlet delivers liquid to said shock waves.

2. The apparatus of claim 1 wherein said arrangement for converting comprises an arrangement for generating pulsation in said flow of gas.

3. The apparatus of claim 1 wherein said arrangement for converting comprises an arrangement that results in a velocity profile, for said flow of gas, which is characterized by an inflection point, wherein said velocity profile provides average velocity in an axial direction for a cross section of said flow of gas after said flow of gas has exceeded sonic velocity as a consequence of flowing through said atomizer.

4. The apparatus of claim 1 wherein said a compression factor of said atomizer is in a range of about 5 to about 50.

5. The apparatus of claim 1 wherein said a compression factor of said atomizer is in a range of about 5 to about 30.

6. The apparatus of claim 1 wherein said arrangement for converting comprises an arrangement for generating transverse components of speed in said flow of gas.

7. The apparatus of claim 6 wherein a sufficient amount of transverse components of speed are generated to result in a velocity profile that is characterized by an inflection point, wherein said velocity profile provides average velocity in an axial direction for a cross section of said flow of gas after said flow of gas has exceeded sonic velocity as a consequence of flowing through said atomizer.

8. The apparatus of claim 1 wherein said arrangement for converting generates a sound pressure level of at least about 160 dB in an atomization region of said atomizer.

9. The apparatus of claim 1 wherein said arrangement for converting causes said flow of gas to pulse at a rate of at least 18,000 times per second.

10. The apparatus of claim 1 wherein arrangement for converting comprises a nozzle, wherein said flow of gas flows through said nozzle before said shock waves are generated.

11. The apparatus of claim 10 wherein a conicity angle of said nozzle is in a range of about 50 to about 80 degrees.

12. The apparatus of claim 10 wherein a compression factor across said nozzle is in a range of about 5 to about 50.

13. The apparatus of claim 10 wherein a compression factor across said nozzle is in a range of about 5 to about 30.

14. The apparatus of claim 10 wherein said arrangement for converting comprises a gas cavity, wherein said gas cavity delivers said flow of gas to said nozzle.

15. The apparatus of claim 10 wherein gas flows in a first direction as it enters said gas cavity and said gas flows in a second direction as it leaves said gas cavity, wherein said first direction is different from said second direction.

16. The apparatus of claim 10 wherein arrangement for converting comprises a resonator, wherein said resonator is downstream of said nozzle.

17. The apparatus of claim 16 wherein said resonator is dimensioned and arranged to provide a frequency of oscillation that is in a range of about 16 kHz to about 20 kHz.

18. The apparatus of claim 10 further comprising a liquid outlet, wherein said liquid outlet delivers liquid to an atomization region proximal to a site at which said shock waves are generated.

19. The apparatus of claim 1 wherein a pressure of said gas at an inlet to said atomizer is in a range of about 25 to about 55 psig.

20. The apparatus of claim 11 wherein a pressure of said gas at said nozzle is in a range of about 21 psig to about 52 psig.

21. The apparatus of claim 12 wherein a pressure of said gas at said nozzle is in a range of about 21 psig to about 52 psig.

22. The apparatus of claim 13 wherein a pressure of said gas at said nozzle is in a range of about 21 psig to about 52 psig.

23. The apparatus of claim 18 wherein said apparatus is a system for fire suppression, and wherein said liquid is water and said gas is nitrogen, and further wherein said system comprises:

a first conduit for coupling said atomizer to a supply of said liquid;

a second conduit for coupling said atomizer to a supply of said gas; and

a detection device for detecting a condition indicative of fire.

24. The apparatus of claim 1 further comprising:

a liquid inlet for receiving a flow of water; and

a gas inlet for receiving said flow of gas.

25. An apparatus comprising an atomizer, wherein said atomizer comprises:

a body portion, wherein said body portion receives a flow of gas, and wherein said body portion comprises an arrangement that is physically adapted to:

generate pulsations within said flow of gas after said flow of gas exceeds sonic velocity;

affect said flow of gas such that a velocity profile for said flow of gas is characterized by an inflection point, wherein said velocity profile provides average velocity in an axial direction for a cross section of said flow of gas after it exceeds sonic velocity.

26. The apparatus of claim 25 wherein said arrangement comprises a nozzle, wherein said flow of gas is directed through said nozzle, and wherein a compression factor across said nozzle is in a range of between about 5 to about 50.

27. The apparatus of claim 25 wherein said arrangement comprises a nozzle, wherein said flow of gas is directed through said nozzle, and wherein a compression factor across said nozzle is in a range of between about 5 to about 30.

28. The apparatus of claim 25 wherein said arrangement comprises a nozzle, wherein a conicity angle of said nozzle is in a range of between about 50 to about 80 degrees.

29. The apparatus of claim 26 wherein a conicity angle of said nozzle is in a range of between about 50 to about 80 degrees.

30. The apparatus of claim 25 wherein:

said arrangement comprises a nozzle;

said atomizer further comprises a surface for braking said flow of gas;

said surface is spaced apart from said nozzle;

said arrangement, in conjunction with said surface, is physically adapted to convert at least ten percent of an energy of said flow of gas into shock waves after said flow of gas passes through said nozzle.

31. The apparatus of claim 30 wherein said shock waves propagate in an atomization region, and further wherein said body portion comprises:

a liquid inlet for receiving a flow of liquid; and

a liquid outlet for directing said flow of liquid to said atomization region.

32. An apparatus comprising an atomizer, wherein said atomizer comprises a nozzle, and wherein a compression factor across said nozzle is in a range of about 5 to about 50, and further wherein a conicity angle of said nozzle is in a range of about 50 to about 80 degrees.

33. The apparatus of claim 32 wherein a pressure of gas at said nozzle is in a range of between about 21 psig to about 52 psig.

34. An apparatus comprising an atomizer, wherein said atomizer comprises:

a gas cavity, wherein said gas cavity has an inlet;

a gas nozzle, wherein said gas nozzle is downstream of said gas cavity and is in fluidic communication therewith; and

a resonator, wherein said resonator is downstream of said gas nozzle and is spaced apart from said gas nozzle, and wherein one or more of said gas cavity, said gas nozzle, and said resonator possesses physical adaptations that collectively result in the conversion of at least ten percent of an energy of a flow of gas that flows through said atomizer into shock waves.

35. The apparatus of claim 34 wherein said physical adaptation is that dimensions of said gas nozzle result in a compression factor across said gas nozzle that is within a range of about 5 to about 50.

36. The apparatus of claim 34 wherein said physical adaptation is that dimensions of said gas nozzle result in a compression factor across said gas nozzle that is within a range of about 5 to about 30.

37. The apparatus of claim 34 wherein said physical adaptation is that a conicity angle of said gas nozzle is within a range of about 50 to about 80 degrees.

38. The apparatus of claim 34 wherein a pressure of a flow of gas in said cavity is in a range of about 21 to 52 psig.

39. The apparatus of claim 34 wherein said gas cavity and said gas nozzle are dimensioned and arranged to generate transverse components of speed within said flow of gas such that a velocity profile for said flow of gas is characterized by an inflection point, wherein said velocity profile provides average velocity in an axial direction for a cross section of said flow of gas after it exits said gas nozzle.

40. An apparatus comprising an atomizer, wherein said atomizer comprises an arrangement for converting at least fifteen percent of an energy of a flow of gas that flows through said atomizer into shock waves.

41. The apparatus of claim 40 wherein said arrangement converts at least twenty percent of said energy of said flow of gas that flows through said atomizer to shock waves.

42. The apparatus of claim 40 wherein said arrangement converts at least twenty-five percent of said energy of said flow of gas that flows through said atomizer to shock waves.

43. An apparatus comprising an atomizer, wherein said atomizer comprises a body portion, wherein said body portion comprises:

a gas aperture;

an annular gas cavity, wherein said gas cavity receives a flow of gas from said gas aperture;

an annular gas nozzle, wherein said gas nozzle receives said flow of gas from said gas cavity, wherein:

a bulk of said flow of gas flows in a first direction through said gas aperture;

a bulk of said flow of gas flows in a second direction through said gas nozzle; and

said first direction is substantially orthogonal to said second direction.

44. The apparatus of claim 43 wherein said atomizer comprises a resonator, wherein said resonator is spaced apart from said gas nozzle.

45. The apparatus of claim 43 wherein said body portion comprises:

a liquid inlet, wherein said liquid inlet is disposed at a marginal region of said body portion;

an annular liquid cavity, wherein said liquid cavity receives a flow of liquid from said liquid inlet; and

an liquid outlet, wherein said liquid outlet receives said flow of liquid from said annular liquid cavity.

46. The apparatus of claim 45 wherein liquid outlet delivers said flow of liquid to an atomization region that is disposed proximal to said gas nozzle.

47. An apparatus comprising an atomizer, wherein said atomizer consists essentially of three parts, wherein said three parts are:

a casing, wherein said casing has an axially-disposed opening;

a central core, wherein a portion of said central core is received by said opening in said casing, and wherein a gas cavity and a gas nozzle are defined in a space between said casing and said central core; and

a cowling, a portion of said cowling abuts a portion of an outer surface of said casing.

48. The apparatus of claim 47 wherein a liquid cavity and a liquid outlet channel are defined by a surface of said cowling and a groove in said casing.

49. The apparatus of claim 47 further comprising radially-disposed gas apertures, wherein said gas apertures couple said gas cavity to a gas inlet.

50. The apparatus of claim 47 further comprising a cavity resonator, wherein said cavity resonator is defined by an annular channel in said central core, wherein said annular channel is spaced apart from and opposed to said gas nozzle.

51. The apparatus of claim 47 wherein said gas nozzle has a conicity angle that is within a range of about 50 to about 80 degrees.

52. The apparatus of claim 47 wherein a compression factor across said gas nozzle is in a range of about 5 to about 50.

53. A method comprising:

receiving a flow of gas;

accelerating said flow of gas to supersonic velocity; and

generating an amount of pulsation in said flow of gas sufficient to enable conversion at least ten percent of an energy of said flow of gas into shock waves.

54. The method of claim 53 comprising delivering liquid to a region proximal to a location at which said shock waves are created.

55. The method of claim 53 wherein generating an amount of pulsation comprises generating transverse components of speed in said flow of gas, wherein said transverse components are sufficient to create an inflection point in a velocity profile, wherein said velocity profile provides average velocity in an axial direction for a cross section of said flow of gas after it has accelerated to supersonic velocity.

56. The method of claim 53 wherein generating an amount of pulsation comprises affecting said flow of gas so that a velocity profile of said flow of gas is characterized by an inflection point, wherein said velocity profile provides average velocity in an axial direction for a cross section of said flow of gas after it has accelerated to supersonic velocity.

57. The method of claim 53 wherein generating an amount of pulsation comprises providing a gas nozzle having a compression factor that is in a range of about 5 to about 50.

58. The method of claim 53 wherein generating an amount of pulsation comprises providing a gas nozzle having a conicity angle that is in a range of about 50 to about 80 degrees.

59. The method of claim 53 wherein generating an amount of pulsation further comprises generating an amount of pulsation in said flow of gas sufficient to enable conversion of at least fifteen percent of said energy of said flow of gas into shock waves.

60. The method of claim 53 wherein generating an amount of pulsation further comprises generating an amount of pulsation in said flow of gas sufficient to enable conversion of at least twenty percent of said energy of said flow of gas into shock waves.

61. The method of claim 53 wherein generating an amount of pulsation further comprises generating an amount of pulsation in said flow of gas sufficient to enable conversion at least twenty-five percent of said energy of said flow of gas into shock waves.